

**Tyrone E. Greaves**

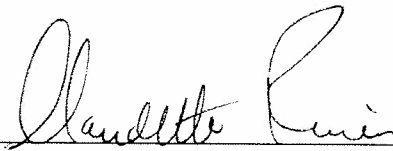
Managing Support Functions



Public Works and Engineering

Utility Maintenance Branch

Engineering Services Section

Approved by:   
Supervisor

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# TABLE OF CONTENTS

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Mission Statement.....*i*

Acknowledgement.....*ii*

Photographs.....*iii.*

Introduction.....1

Manage Support.....1-6

Conclusion.....6

Bibliography.....7

## MISSION STATEMENT

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**"To be the nation's leading Public Utility, champion for the environment, providing reliable service of exceptional quality to the most satisfied customers in the nation."**

# ACKNOWLEDGEMENTS

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This endeavor would not have been possible without:

Claudette River	D.A.D., Systems Maintenance
Rudy Galvan	Sr. Project Manager
Greg McGill	Project Manager
Jackie Lathan	Sr. Inspector
Roger Garrett	Project Technical II

**LIST OF PHOTOGRAPHS**

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Figure 1 .....2

Figure 2 .....6

Figure 3 .....7

## **Engineering Services: Managing Support Functions**

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The City of Houston with a population of 2.14 million and growing, utilizes the Public Works and Engineering Department to provide many of the basic water and wastewater services that influence the lives of everyone who resides within the City of Houston.<sup>[1]</sup> To meet this obligation, the City of Houston produces over 146 billions gallons of water per year and treats over 90 billion gallons of wastewater per year, which is transported through 14,000 miles of pipe lines.<sup>[2][3]</sup>

These distribution and collection lines are critical components that aid in distributing fresh water to citizens and conveying wastewater to treatment plants. The Engineering Services Section of the Utility Maintenance Branch supports maintenance and repair operations for both water and wastewater systems.

The Utilities Maintenance Branch divides the City of Houston into four quadrants, as shown in *Figure 1*.

Click on a community to learn more.

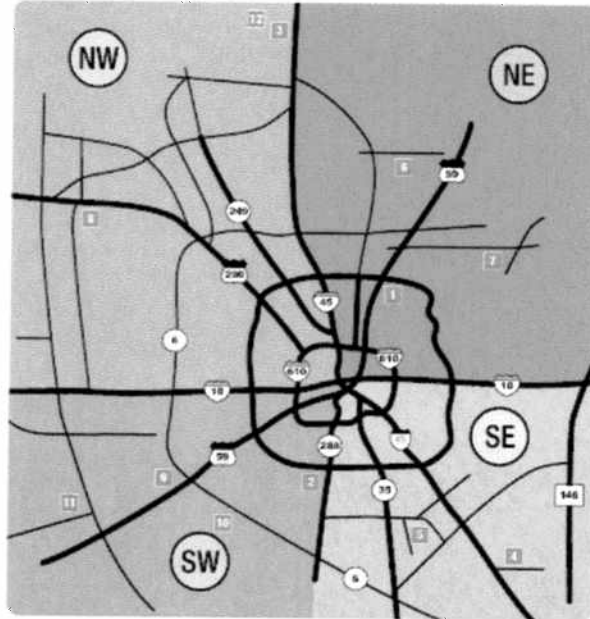


Figure 1: City of Houston Quadrants

The Engineering Services Section assists with special jobs in every quadrant. For example, the repairing of a pipe line that goes under a bayou.<sup>[4]</sup> They also perform investigations and water point repairs. Using Contractors is another way of support for large time consuming jobs and high workload periods. **"During certain times of the year (July-October), leaks occur at a faster rate than the Utilities Maintenance Branch can repair them"-311.** Contractors are hired to support City crews, which decreases the backlog of work that has to be performed by crews.

Another critical function that Engineering Services Section provides is to help identify distribution lines that need replacing. **"Due to electrolysis, ground**

**shifting and time, the cost of repeatedly repairing a dilapidated line will be more costly than replacing it"-**

**Greg McGill.** Engineering Services compiles lists of piping line repairs and their possible causes of failure from their history of repair records. These lists will indicate which lines would be economically better to replace rather than constantly repaired. These lists are submitted to the City Engineers Office for possible inclusion in plans for Capital Improvement Projects (CIP). The Engineering Services Section is also involved in coordinating implementation of Capital Improvements to the City's water, wastewater, street and storm sewer projects.

Project managers review waterline plans for City Improvement Projects to make sure that the details are up to code and include requests for adjustments that will make maintenance and repair less likely or easier. There are also Capital Improvement Projects contracts used to improve parts of the water and wastewater systems. For example, the Carrera Contract is focused on removing all water meters that are located in the backyard easements of residences and relocating them to the front.

The City of Houston has specifications, for various repairs, that are designed to reinforce reliability. These standards are enforced on all contracts. These specifications are designed to decrease maintenance



request and/or provide a quality type of repair. This helps ensure that quality work is being performed in a standardized manner.

Engineering Services uses project managers and construction inspectors to manage the operations of contractors, so the City can help ensure that the work is up to specification as stated in the agreed contract. This ensures that the components are installed correctly and safely. Project managers are on the project from its conception to its completion, and they make sure those safety regulations for every employee is adhered to, projects are completed on time, and the quality of the work is up to standard. Contractor projects become the responsibility of the Utilities Maintenance Branch after a 12 month warranty period.

The Engineering Services Section also explores new and innovative ways of improving our infrastructure. For example, state laws require certain minimum pressures be maintained in distribution lines for firefighting. However, this increases the potential for water line breaks. This is especially true at turns or bends in the pipeline, because the amount of force within a line is focused on bends. A concrete thrust block is used to stabilize the bend, as shown in *Figure 2*.

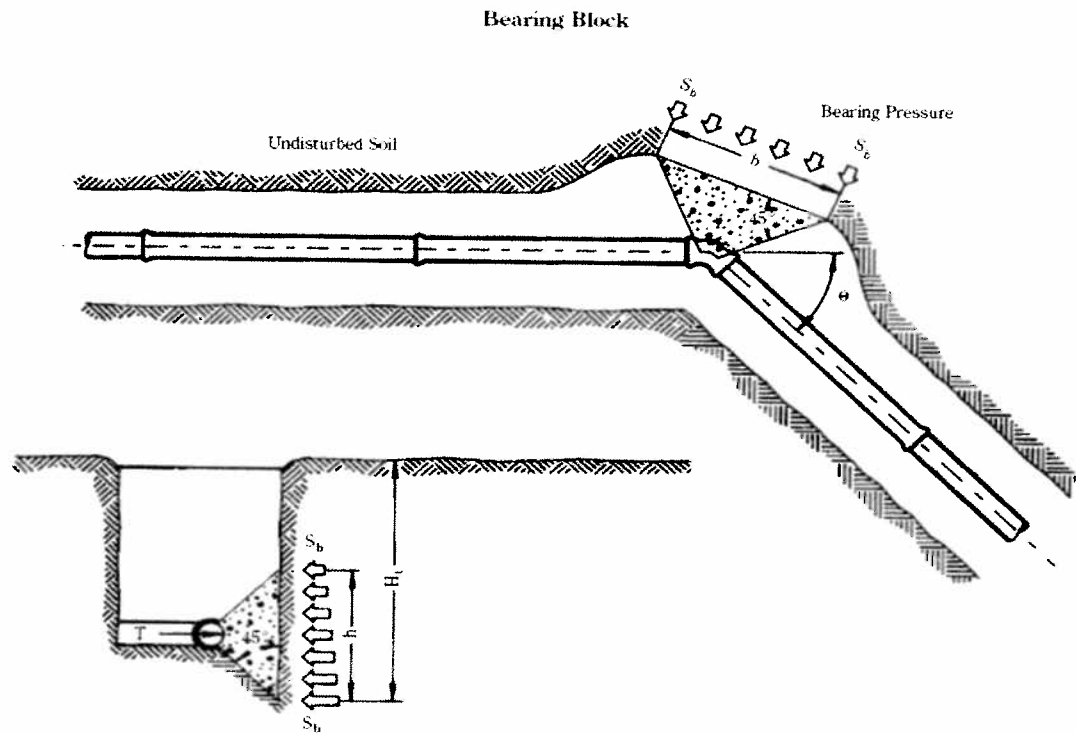


Figure 2: Concrete Thrusting Block

Providing that the thrust block stays in position, this method works. However, ground shifting and/or improper pipe setting on the thrusting block can lead to line failure. A new technique is the use of mechanical joint restraints for bends, which is designed to fasten pipes together against tons of pressure, as shown in Figure 3.

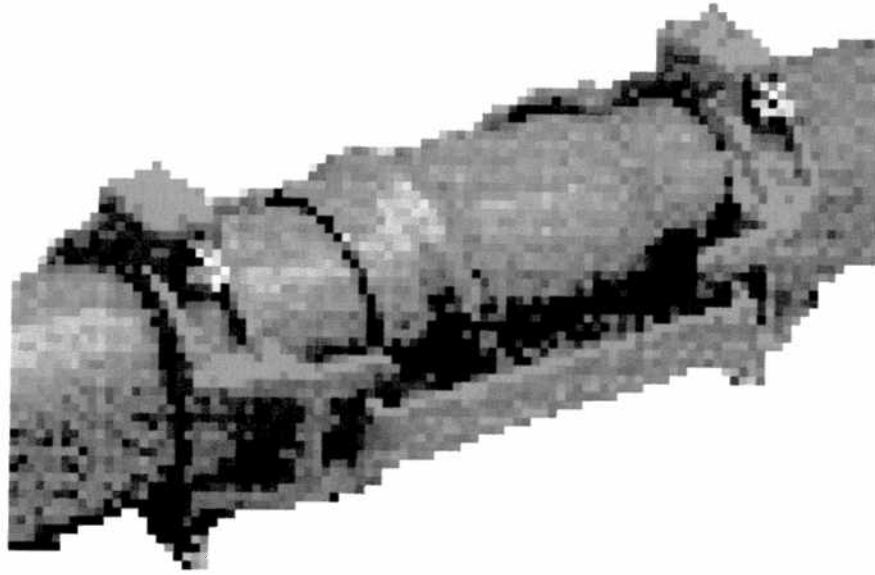


Figure 3: Mechanical Joint Restraint

These types of restraints provide faster, cheaper, more reliable and stable method of holding pipes together against pressure versus the concrete thrusting block.<sup>[5]</sup> Also, compared to concrete, they are a cheaper option that can be used in wet conditions. Innovative components, such as these, will decrease maintenance and reduce the time of repairs.

In conclusion, the maintenance of the distribution and collection systems is an enormous responsibility that requires daily monitoring by the Utilities Maintenance Branch. The Engineering Services Section is part of this effort that keeps water and wastewater safely flowing for the 2.14 million people who call Houston home.

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